10 週齢のメタボリックラットと対照ラット間の肝臓におけるコレステロール調節酵素とレセプターの比較

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Comparison of Receptors and Enzymes Regulating Cholesterol Levels in Liver between SHR/NDmcr-cp Rats and Normotensive Wistar Kyoto Rats at Ten Weeks of Age

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ABSTRACT: The spontaneously hypertensive rat (SHR)/ND mcr-cp (SHR-cp), which is a metabolic syndrome model rat, was reported to show hypercholesteremia, as compared with lean littermates. The serum total cholesterol level in SHR-cp at 18 weeks of age is higher than that of normotensive Wistar Kyoto rat (WKY), but that in SHR-cp at 10 weeks of age is the same. The objective of this study is to clarify whether there are differences in the system regulating serum cholesterol levels between SHR-cp and WKY at 10 weeks of age. Total serum cholesterol levels, and cholesterol levels of HDL, LDL, and VLDL were similar in the two strains. However, the cholesterol levels in the liver of SHR-cp were lower than those of WKY. Next, mRNA levels of receptors (scavenger receptor class B type 1 [SRB1], LDL receptor [LDLR]) involved in uptake from serum to liver or enzymes of cholesterol catabolism (CYP7A1 and CYP8B1) and biosynthesis (mevalonate pyrophosphate decarboxylases [MPD]) in liver were compared between SHR-cp and WKY. High levels of SRB1 and low levels of MPD and LDLR were shown in SHR-cp, as compared with WKY. CYP7A1 and CYP8B1 levels were similar between SHR-cp and WKY. These results suggest that the serum cholesterol level in SHR-cp by the balance or regulation between the rise in cholesterol uptake and reduction in cholesterol biosynthesis in the liver is the same as that in WKY.

抄録　10 週齢のメタボリックラットと対照ラットの血清コレステロール量は、同じであった。調節に関与する酵素とレセプターの発現量を調べた結果、メタボリックラット肝中のコレステロール合成酵素の１つであるメバロン酸二リン酸脱炭酸酵素の減少と、ＨＤＬの取り込みに関与するスカベンジャーレセプタークラスＢタイプ１の増加が示された。つまり、これらの調節あるいはバランスにより、メタボリックラットの血清コレステロールは対照ラットと同程度に維持されていることが示唆された。